National Institute of Environmental Health Sciences

Air pollution toxicology--A brief review of the role of the science in shaping the current understanding of air pollution health risks

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Abstract:

Human and animal toxicology has had a profound impact on our historical and current understanding of air pollution health effects. Early animal toxicological studies of air pollution had distinctively military or workplace themes. With the discovery that ambient air pollution episodes led to excess illness and death, there became an emergence of toxicological studies that focused on industrial air pollution encountered by the general public. Not only did the pollutants investigated evolve from ambient mixtures to individual pollutants but also the endpoints and outcomes evaluated became more sophisticated, resulting in our present state of the science. Currently, a large toxicological database exists for the effects of particulate matter and ozone, and we provide a focused review of some of the major contributions to the biological understanding for these two "criteria" air pollutants. A limited discussion of the toxicological advancements in the scientific knowledge of two hazardous air pollutants, formaldehyde and phosgene, is also included. Moving forward, the future challenge of air pollution toxicology lies in the health assessment of complex mixtures and their interactions, given the projected impacts of climate change and altered emissions on ambient conditions. In the coming years, the toxicologist will need to be flexible and forward thinking in order to dissect the complexity of the biological system itself, as well as that of air pollution in all its varied forms.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Temperature

Air Pollution: Interaction with Temperature, Ozone, Particulate Matter

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Developmental Effect, Respiratory Effect

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Children, Elderly, Pregnant Women

Resource Type: ☑

format or standard characteristic of resource

Review

Timescale: ☑

time period studied

Time Scale Unspecified